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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,558	11/21/2003	Shuichi Nagai	60188-715	8465

7590 08/01/2005

Jack Q. Lever, Jr.  
McDERMOTT, WILL & EMERY  
600 Thirteenth Street, N.W.  
Washington, DC 20005-3096

EXAMINER
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CONNELLY CUSHWA, MICHELLE R

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 08/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/717,558

Applicant(s)

NAGAI, SHUICHI



Examiner

Michelle R. Connelly-Cushwa

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-18 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1103</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

The prior art documents submitted by applicant in the Information Disclosure Statement filed on November 21, 2003 have all been considered and made of record (note the attached copy of form PTO-1449).

### ***Drawings***

Eleven (11) sheets of formal drawings were filed on November 21, 2003 and have been accepted by the Examiner.

### ***Specification***

The disclosure is objected to because of the following informalities: "FIG 3C" on page 7, line 25, should be --FIG 2C--.

Appropriate correction is required.

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1-11, 13 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Paiam (US 6,535,672 B1).**

Regarding claims 1-7; Paiam discloses an optical functional device in Figures 17-19, comprising:

- first and second optical waveguides having mutually different equivalent refractive indices ( $n_1$  and  $n_2$ ); and
- a connection through which the two optical waveguides are connected along an optical axis (see column 7, line 17, through column 8, line 50);
- wherein a second of the optical waveguides has an equivalent refractive index lower than that of a first of the optical waveguides;
- wherein the connection allows multimode propagation of a light passing through the second optical waveguide, and allows the light to be coupled into the first optical waveguide (see column 7, line 17, through column 8, line 50);
- wherein the first optical waveguide allows single mode propagation of a light passing therethrough (see column 3, lines 18-28);
- wherein the equivalent refractive index of the connection is changed in steps along the optical axis (the equivalent refractive index of the

connection region,  $n_2$ , is changed in a step between the connection region and the output waveguides); and

- wherein the equivalent refractive index of the connection is changed in steps along a direction approximately perpendicular to the optical axis (the equivalent refractive index of the connection region,  $n_2$ , is changed in a step between the connection region and the waveguide having refractive index  $n_1$ ).

Regarding claim 8; Paam discloses an optical functional device in Figures 17-19, comprising:

- two optical waveguides having mutually different refractive indices ( $n_1$  and  $n_2$ ); and
- a connection through which the two optical waveguides are connected;
- wherein single mode propagation of a light incident on one of the optical waveguides, having a high refractive index, is allowed through the one of the optical waveguides; and
- wherein multimode propagation of a light incident on the other optical waveguides having a low refractive index is allowed through the other optical waveguide and the connection, thus realizing optical nonreciprocity.

Regarding claim 9; Paam discloses that the waveguide of the invention may be configured to operate as a filter/isolator (see column 5, lines 14-23).

Regarding claim 10; Applicant is claiming the product including the process of making the second optical waveguide, and therefor are of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. In re Thrope, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. In re Brown and Saffer, 173 USPQ 685 and 688; In re Pilkington, 162 USPQ 147.

As such no weight is given to the process steps recited in claim 10.

Paam discloses all of the limitations of claim 10 as applied above. The second optical waveguide is wider than first optical waveguide in the connection region.

Regarding claim 11; the first and second waveguides are provided as a planar lightwave circuit, and the first and second optical waveguides are horizontally arranged (see Figures 17 and 18).

Regarding claim 13; the first and second optical waveguide each include a core and a cladding and a difference between the equivalent refractive index of the first

Art Unit: 2874

optical waveguide and that of the second optical waveguide is determined by the cladding.

Regarding claim 15; Paiam discloses that the waveguide of the invention may be configured to operate as a filter/isolator (see column 5, lines 14-23).

**Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Leonard (US 5,854,866).**

Regarding claims 1 and 2; Leonard discloses an optical functional device in Figures 4 and 5, comprising:

- first and second optical waveguides (401 and 402 in Figure 4; 501 and 502 in Figure 5) having mutually different equivalent refractive indices; and
- a connection (406) through which the two optical waveguides are connected along an optical axis;
- wherein a second of the optical waveguides has an equivalent refractive index lower than that of a first of the optical waveguides.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 12 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paiam (US 6,535,672 B1).**

Regarding claim 12; Paiam discloses all of the limitations of claim 12 as applied above, except for specifically stating that the second optical waveguide is located over the first optical waveguide, or that the first optical waveguide is located over the second optical waveguide. The first and second optical waveguides are each provided as a planar lightwave circuit in the invention of Paiam. It is within the level of ordinary skill in the art to orient or position the device in any desired manner to ensure that the device couples with other optical elements in whatever optical network/circuit the device is employed in. Additionally, it appears that the device of Paiam would perform equally well regardless of the particular orientation/position of one of the waveguides with respect to the other of the waveguides. Therefore, one of ordinary skill in the art would have found it obvious to either rotate the device disclosed by Paiam so that the first optical waveguide is located over the second optical waveguide, or the second optical waveguide is located over the first optical waveguide; or to form one optical waveguide over the other optical waveguide in order to properly align the waveguides of the device of Paiam with additional optical waveguides or optical elements that the device is employed in conjunction with.

Regarding claims 16-18; Paiam discloses all of the limitations of claims 16-18 as applied above, except for specifically stating that the optical functional device is incorporated in an optical module comprising a laser element and a light-receiving element. One of ordinary skill in the art would have found it obvious to incorporate the invention of Paiam as a filter in any optical system/module, which includes both a laser element and a light-receiving element, since the optical functional device of Paiam is an



Art Unit: 2874

optical coupler, and optical couplers are commonly used to couple light that originates at a laser source and is received at a light-receiving element in an optical system/module.

***Allowable Subject Matter***

**Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claim 14 distinguishes over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical functional device as defined in claim 14, wherein the difference between the equivalent refractive indices is determined by a difference between the thickness of the cladding of the first waveguide and that of the cladding of the second waveguide in combination with the other limitations of claim 14 and the limitations of the base and intervening claims.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claim 14.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Garito et al. (US 5,845,025), Alferness et al. (US 4,146,297); Ooba et al. (US 6,122,416); Marcuse et al. (US 6,144,780) ; Thomas (US 5,123,078) ;

Art Unit: 2874

and Lackritz et al. (US 6,724,968 B2) each disclose optical functional devices having first and second waveguides and a connection therebetween.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

*Michelle R. Connelly-Cushwa*  
Michelle R. Connelly-Cushwa  
Primary Examiner  
July 26, 2005